

PROCEEDINGS
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DRAGON-FLIES FROM THE ENGLISH OLIGOCENE.

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The material described below was collected by the Rev. P. B. Brodie in the Oligocene beds at Gurnet Bay, in the Isle of Wight, and represents the Oligocene Odonate fauna of Britain, as far as we know it to-day. It is noteworthy that two of the species have Indo-Malay affinities; one represents a genus which existed in Europe and America in Tertiary times, but is now confined to America; the fourth belongs to a genus still present in Britain. The specimens are all in the British Museum.

Oligoaeschna* (?) *anglica new species. Fig. 1.

Costo-apical region of wing preserved. Stigma elongated (length 4 mm.), bounded by $2\frac{1}{2}$ cells below; five cells on costal margin beyond stigma; below the base of stigma are two rows of cells between M_1 and M_2 , but M_2 is then deflected strongly downward, and the rows of cells increase to three, and toward the apex of the wing, where they become small and irregular, to four or more; M_2 separated from R_s by two rows of cells, the number not increasing below base of stigma, where the interval is conspicuously greater; R_s separated from supplementary vein below by a single row of cells. The part of the wing preserved is hyaline.

Gurnet Bay (Brodie). British Museum, 8649.

This could be referred to *Oligoaeschna* of the Indo-Malay region or *Gomphaeschna* of the nearctic. The strong downward bend of M_2 is like that of *Oligoaeschna*, as is also the shape of the stigma; so the indications, as far as they go, are in favor of *Oligoaeschna* rather than *Gomphaeschna*. The remarkable bend of M_2 occurs also in the Jurassic genera *Cymatophlebia* and *Morbaeschna*.

Oplonaeschna vectensis new species. Figs. 2, 3, 4.

The type shows the stigma with adjacent parts, and has the following characters: Stigma, 5 mm. long, bounded by $3\frac{1}{2}$ cells below; M_2 bent downward below base of brace-vein of stigma, and at this point the cells

between M_1 and M_2 become double; below middle of stigma the supplementary vein below M_1 begins, and below end of stigma the cells between it and M_1 become double, while those between it and M_2 are in three rows from level of middle of stigma; below the stigma M_2 is separated from R_3 by three rows of cells. R_3 is separated from the supplementary vein below it by at least four rows of cells, as is seen in No. 8636, which shows the part of the wing immediately basad of that preserved in the type. In 8636 the stigma is only 4.5 mm. long, and is bounded by three cells below.

No. 8590 exhibits the triangle and adjacent parts, and appears to belong to *O. vectensis*. The triangle is 2.25 mm. long, five celled, formula 2, 1, 1, 1. It is formed as in *O. separata* Scudder, from the Florissant Miocene. The base of the triangle is bounded by one cell and a minute fraction of a second. The branches of the media arise below the middle of the arculus. Basal space without cross-veins.

Gurnet Bay (Brodie). British Museum, 8572 (type), 8636, 8590.

By the number of cells between R_3 and the supplementary vein below, this resembles the European (Radoboj) fossil *O. metis* (Heer) and the Florissant *O. lapidaria* Cockerell and Counts. The triangle and adjacent parts resemble those of *O. separata*, and especially *O. lapidaria*. The long (*Boyeria*-like) stigma also associates the species with *O. lapidaria*, not with the living *O. armata*.

Megalestes anglicus Cockerell. Fig. 5.

Megalestes (?) *anglicus* Cockerell, Proc. U. S. Nat. Mus., 49 (1915), p. 498.

This name was based on part of the basal half of a wing, but a specimen now before us (Gurnet Bay, Brodie; Brit. Mus. 8548) appears to represent the apex of the wing of the same species. It has in general the characters of *Megalestes major* Selys, but the light brown pterostigma is more produced apically, its apical margin being long and very oblique, the apical point forming an angle of about 45°. The stigma therefore approaches the condition which is more exaggerated in *Amphipteryx*, but it is to be noted that the basal side remains quite unmodified from the *Megalestes* type. There are five simple cross-veins beyond the stigma, and the costal cells between the stigma and nodus are much longer than high. The ultranodal sector (between M_1 and M_2) begins only seven cells (in longitudinal row) basad of level of stigma; it is straight (not zigzag as in *Lestes*). Length of stigma about 2.3 mm.

Enallagma oligocena new species. Figs. 6, 7.

The type (Gurnet Bay, Brodie; Brit. Mus. 8631) consists of the bases of both wings. In the division of the Coenagrionines on the character of the postcosta, this falls entirely with *Enallagma* and the related genera, the postcosta leaving the margin of the wing at a distance from the basal postcostal cross-vein much greater than the latter is long (the actual distance, in the hind wing, is about 880 μ , the length of the cross-vein being

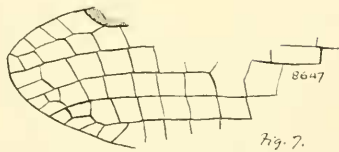
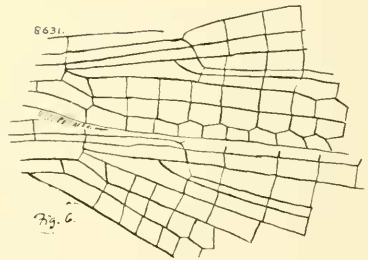
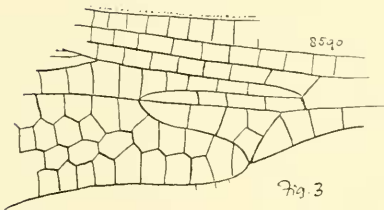
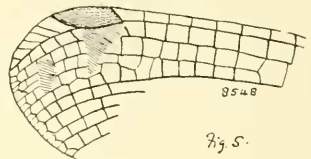
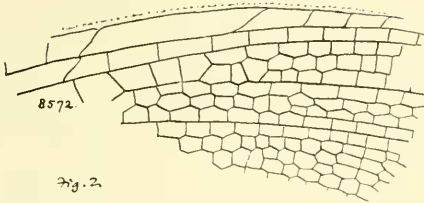
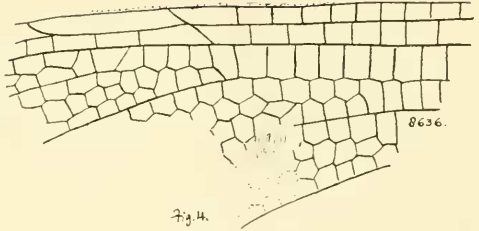
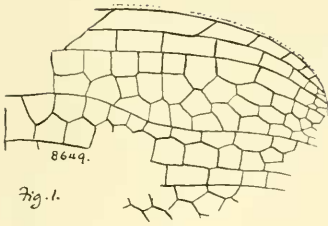


Fig. 1.—*Oligoaeschna anglica*.
 Fig. 2.—*Oploniaeschna rectensis*.
 Fig. 3.—*Oploniaeschna rectensis*.

Fig. 4.—*Oploniaeschna rectensis*.
 Fig. 5.—*Megalestes anglicus*.
 Fig. 6.—*Enallagma oligoecna*.

Fig. 7.—*Enallagma oligoecna*.